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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/814,693	03/15/2001	Kimio Tatsuno	NIT-272	4307

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EXAMINER	
CURS, NATHAN M	

ART UNIT	PAPER NUMBER
2633	

DATE MAILED: 06/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/814,693	TATSUNO ET AL.	
	Examiner	Art Unit	
	Nathan Curs	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 November 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 November 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Hori (US Patent No. 4821273).

Regarding claim 1, Hori discloses optical-fiber communication equipment (Fig. 5) (col. 7, lines 34-50) comprising: a laser light source (denoted by numerical reference 1), a means (lens - located next to laser) for changing light of the laser light source to a parallel plane wave to form a parallel light path, an etalon having two or more transmission bands, and first and second light detectors, wherein: said etalon (38) is located in the parallel light path; the parallel plane wave is divided (17 and 18) into at least two pieces of light including light that is transmitted through said etalon and light passing through a medium having optical characteristics different from those of the light that is transmitted through said etalon; the first light detecting means (40) detects one divided piece of light and the second light detecting means (20) detects the other divided piece of light; signals based on photocurrents from the first and the second light detectors are compared to each other to obtain a signal for setting an

emitting wavelength of the laser light source to a desired value (col. 6, lines 31-34), and said signal is used for controlling a wavelength of the laser light source (col. 5, lines 61-65).

3. Claims 1, 3, 4, 6, 8, 9, 12, 14 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Tei et al. (Hèreinafter "Tei") (U.S. Pat. No. 6,144,025).

Regarding claim 1 and 6, Tei discloses (Fig. 1) (col. 3, line 42 - col. 4, line 17) an optical-fiber communication equipment comprising, a laser light source (denoted by numerical reference 1), a means (lens - denoted by numerical reference 3) for changing light of the laser light source to a parallel plane wave to form a parallel light path, a etalon having two or more transmission bands, and a first and a second light detector, wherein: said etalon (8) is located in the parallel light path; said optical system for dividing the parallel plane wave (5) divides the parallel plane wave into at least two pieces of light including light that is transmitted through said etalon and light passing through a medium having optical characteristics different from those of the light that is transmitted through said etalon; the first light detecting means (PD1) detects one divided piece of light and the second light detecting means (PD2) detects the other divided piece of light, signals from the first and the second light detector are compared (S5 - fig. 16) to each other to obtain a signal (S6) for setting an emitting wavelength of the laser light source to desired value; and said signal is used for controlling a wavelength of the laser light source so that the wavelength is kept to be a given wavelength (Abstract).

Regarding claims 3 and 8, Tei discloses said etalon is a Fabry-Perot type etalon constructed of two or more kinds of materials, which differ from each other in at least one of temperature characteristics and a refractive index (Fig. 9a, col. 7, lines 28-30).

Regarding claims 4 and 9, Tei discloses said etalon is a Fabry Perot type etalon, which depends on a channel grid interval of wavelength division multiplexing optical-fiber

communication (Tei, equations (1) & (2), col. 1, lines 15-21), and thereby temperature characteristics of transmission characteristics of the Fabry Perot type etalon are compensated (Tei, col. 10, lines 23-28).

Regarding claim 12, Tei discloses optical-fiber communication equipment (Fig. 1) comprising: a laser light source, a means (lens - denoted by numerical reference 3) for changing light of the laser light source to a parallel plane wave to form a parallel light path, an optical system for dividing the parallel plane wave, an etalon, and a first and a second light detector, wherein said etalon (8) is located in the parallel light path; said laser light source (1) is a laser light source that is capable of lasing at a plurality of lasing wavelengths (col. 1 , lines 15-19), said etalon has a plurality of light transmission portions having desired wavelengths existing at given wavelength intervals (col. 4, lines 57-60) (equations (1) and (2), col. 7), the wavelength interval of the light transmission portions is equivalent to a channel grid interval of wavelength division multiplexing optical-fiber communication (col. 1 , lines 15-21), any one of said plurality of lasing wavelengths of the laser light source is equivalent to an emitting wavelength corresponding to a desired wavelength that is shifted to a wavelength portion having a highest transmittance among said plurality of light transmission portions provided by the etalon (col. 6, lines 16-22 and Fig. 5), said optical system for dividing the parallel plane wave divides the parallel plane wave into at least two pieces of light including light that is transmitted through said etalon and light passing through a medium having optical characteristics different from those of the light that is transmitted through said etalon (see Fig. 1)., signals based on photocurrents from the first and the second light detector, which received each of said divided pieces of light, are compared (S5 - Fig. 16) to each other to obtain a signal (S6 - Fig. 16) for setting an emitting wavelength of the laser light source to a desired value; and said signal is used for controlling

each of said plurality of lasing wavelengths provided by the laser light source so that each lasing wavelength is kept to be a given wavelength (Abstract).

Regarding claim 14, Tei also discloses said etalon is a Fabry Perot type etalon constructed of two or more kinds of materials (Fig. 9), which differs each other in at least one of temperature characteristics and a refractive index (col. 7, lines 28-29).

Regarding claim 15, Tei discloses a thickness of said Fabry Perot type etalon, which depends on a channel grid interval of wavelength division multiplexing optical-fiber communication (Tei, col. 1 , lines 15-21 and equations (1) & (2) - col. 7), and thereby temperature characteristics of transmission characteristics of the Fabry Perot type etalon are compensated (Tei, col. 10, lines 23-28).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 2, 7 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tei as applied in the claims 1, 6 and 12 above, in view of Miller et al. (Hereinafter "Miller") (U.S. Pat. No. 4,790,634).

Regarding claim claims 2, 7 and 13, Tei discloses an optical communication equipment as described in the above section including a etalon is a Fabry-perot type etalon in which: a refractive index of its medium is within a range of 1.0 to 4.0 (col. 7, lines 58-60), a thickness of

the medium is set so that a plurality of light transmission portions are generated at given wavelength intervals (col. 7, line 65 - col. 8, line 9), and so that any one of the plurality of light transmission portions is equivalent to an emitting wavelength desired for the laser light source. Tei does not clearly show the surface reflectivities of both reflection planes of the medium are within a range of 20 to 70%. However, Miller shows a medium of Fabry-Perot etalon that having the reflectivity of 70% (col. 4, lines 15-18). Therefore, it would have been obvious to one of ordinary skill in the art to apply a surface reflectivities on both reflection planes with the range that taught by Miller into the system of Tei in order to create an optical communication system that has abilities to support entirely the emitted wavelengths of laser source and to obtain the reflected light at a desired intensity with a low cost (Miller, col. 2, lines 23-24) since the low reflectivities of the device.

6. Claims 5, 11 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tei as applied to claims land 12 above, in view of Watterson et al. (Hereinafter "Watterson") (U.S. Pat. No. 6,526,079 B1).

Regarding claims 5, 11 and 17, Tei discloses optical-fiber communication equipment (Fig. 1). Tei differs from the claims 5, 11 and 17 of the present invention in that Tei does not show: said laser light source is located at a position that is shifted from an optical axis of the means for changing light of the laser light source to a parallel plane wave to form a parallel light path; or a normal line of an incident end face for said etalon or a laser-light dividing means for dividing the parallel plane is located so that the normal line crosses the optical axis of the means for changing light of the laser light source to a parallel plane wave to form a parallel light path. However, Watterson discloses an arrangement of the optical system wherein, the light source (13) is located at a position that is shifted from an optical axis of the means for changing

light of the laser light source to a parallel plane wave to form a parallel light path (See Watterson Fig. 5), or a normal line of an incident end face for said etalon (18) or the laser-light dividing means (26) is located so that the normal line crosses the optical axis of the means for changing light of the laser light source to a parallel plane wave to form a parallel light path (col. 4, lines 25-36). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to do this since the arrangement as taught by Watterson would directed the reflected light to focus on another point but not on the laser source. If such the arrangement is introduced into the system of Tei, then the reflected light would be prevented to return back to the laser source which constitutes interferences and/or fluctuations of a laser output. Further, this setting provides tunability of the predetermined wavelength by adjusting the angle of the etalon (Watterson, col., 4, lines 53-60).

7. Claims 10 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tei (U.S. Pat. No. 6,144,025) as applied in the claims 6 and 12 above, in view of Munks et al. (Hereinafter "Munks") (U.S. Pat. No. 6353623).

Regarding claims 10 and 16, Tei discloses an optical communication as described in the above section; however, Tei fails to teach an information storing portion for storing temperature characteristics of a light transmission portion of the etalon, and according to a signal from the temperature detecting means and said stored temperature characteristics of light transmission portion of the etalon, a shift of an emitting wavelength of the laser light source from a channel grid wavelength is compensated. However, Munks discloses an information storing portion (col. 7, lines 54-67), and said laser light source comprises a temperature detecting means (56, fig. 1), wherein the information storing portion stores temperature characteristics of a light transmission portion of the etalon (col. 7, lines 54-67), and according to a signal from the temperature

detecting means and said stored temperature characteristics of light transmission portion of the etalon, a shift of an emitting wavelength is compensated (col. 2, lines 36-59). Therefore, as both Tei and Munks are in the same field of optical communication, it would have been obvious to one of ordinary skill in the art at the time of the invention to employ a storing means for storing the temperature characteristics as taught by Munks into the optical system of Tei in order to store the temperature information. One would have motivated for doing this since storing information would provide the benefit of easier wavelength and power monitoring considering temperature, without significant interruption of the light.

8. Claims 18 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tei (U.S. Pat. No. 6,144,025) in view of Watterson et al. (Hereinafter "Watterson") (US Patent Application Publication No. 2004/0091002 A1).

Regarding claims 18 and 21, Tei optical-fiber communication equipment, comprising: Regarding claim 1 and 6, Tei discloses (Fig. 1) (col. 3, line 42 - col. 4, line 17) an optical-fiber communication equipment comprising, a laser light source (denoted by numerical reference 1), a means (lens - denoted by numerical reference 3) for changing light of the laser light source to a parallel plane wave to form a parallel light path, a etalon having two or more transmission bands, and a first and a second light detector, wherein: said etalon (8) is located in the parallel light path; said optical system for dividing the parallel plane wave (5) divides the parallel plane wave into at least two pieces of light including light that is transmitted through said etalon and light passing through a medium having optical characteristics different from those of the light that is transmitted through said etalon; the first light detecting means (PD1) detects one divided piece of light and the second light detecting means (PD2) detects the other divided piece of light, signals from the first and the second light detector are compared (S5 - fig. 16) to each

other to obtain a signal (S6) for setting an emitting wavelength of the laser light source to a desired value. Tei does not disclose that photocurrents from the first and second light detectors are compared to obtain a signal representing the free spectral range of the etalon or that said signal representing the free spectral range of the etalon is compared to a wavelength standard of plural standard signals based on wavelengths or that said signal representing the free spectral range is used for controlling a wavelength of the laser light source to match one of the plural standard wavelengths of the wavelength standard. Watterson discloses an etalon-based wavelength monitoring and control assembly where an etalon having a free spectral range corresponding to the desire ITU grid for WDM is used for wavelength locking to any peak wavelength of the grid (paragraphs 0032-0040). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the etalon disclosed by Watterson in the system of Tei to provide the benefit of locking any WDM wavelength using a single etalon with a FSR matched to the ITU grid, as taught by Watterson.

9. Claims 19 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tei (U.S. Pat. No. 6,144,025) in view of Watterson et al. (Hereinafter "Watterson2") (US Patent Application Publication No. 2004/0091002 A1) as applied to claims 18 and 21 above, and further in view of Munks (US Patent No. 6353623).

Regarding claims 19 and 22, the combination of Tei and Watterson2 discloses an optical-fiber communication equipment according to Claim 18, but does disclose an information storing portion for storing temperature characteristics of a light transmission portion of the etalon, and according to a signal from the temperature detecting means and said stored temperature characteristics of light transmission portion of the etalon, a shift of an emitting wavelength of the laser light source from a channel grid wavelength is compensated. However,

Munks discloses an information storing portion (col. 7, lines 54-67), and said laser light source comprises a temperature detecting means (56, fig. 1), wherein the information storing portion stores temperature characteristics of a light transmission portion of the etalon (col. 7, lines 54-67), and according to a signal from the temperature detecting means and said stored temperature characteristics of light transmission portion of the etalon, a shift of an emitting wavelength is compensated (col. 2, lines 36-59). Therefore, as Tei, Watterson2 and Munks are in the same field of optical communication, it would have been obvious to one of ordinary skill in the art at the time of the invention to employ a storing means for storing the temperature characteristics as taught by Munks into the optical system of the combination of Tei and Watterson2 in order to store the temperature information. One would have motivated for doing this since storing information would provide the benefit of easier wavelength and power monitoring considering temperature, without significant interruption of the light.

10. Claims 20 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tei (U.S. Pat. No. 6,144,025) in view of Watterson2. (US Patent Application Publication No. 2004/0091002 A1) as applied to claims 18 and 21 above, and further in view of Munks (US Patent No. 6353623) as applied to claims 19 and 22 above, and further in view of Watterson (US Patent No. 6526079).

Regarding claims 20 and 23, the combination of Tei, Watterson2 and Munks discloses the optical-fiber communication equipment according to claim 18, but does not disclose that said laser light source is located at a position that is shifted from an optical axis of the means for changing light of the laser light source to a parallel plane wave to form a parallel light path; or a normal line of an incident end face for said etalon or a laser-light dividing means for dividing the parallel plane is located so that the normal line crosses the optical axis of the means for

changing light of the laser light source to a parallel plane wave to form a parallel light path. However, Watterson discloses an arrangement of the optical system wherein, the light source (13) is located at a position that is shifted from an optical axis of the means for changing light of the laser light source to a parallel plane wave to form a parallel light path (See Watterson Fig. 5), or a normal line of an incident end face for said etalon (18) or the laser-light dividing means (26) is located so that the normal line crosses the optical axis of the means for changing light of the laser light source to a parallel plane wave to form a parallel light path (col. 4, lines 25-36). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to do this for the combination of Tei, Watterson2 and Munks since the arrangement as taught by Watterson would direct the reflected light to focus on another point but not on the laser source. If such the arrangement is introduced into the combination of Tei, Watterson2 and Munks, then the reflected light would be prevented from returning back to the laser source which would otherwise result in interferences and/or fluctuations of a laser output. Further, this setting provides tunability of the predetermined wavelength by adjusting the angle of the etalon (Watterson, col., 4, lines 53-60).

Response to Arguments

11. Applicant's arguments, filed 29 November 2004, with respect to the Volz reference have been fully considered and are persuasive. The rejections based on Volz have been withdrawn.

12. Applicant's arguments filed 29 November 2004 with respect to the Hori and Tei references have been fully considered but they are not persuasive.

Regarding claim 1, the applicant argues that Hori does not disclose a wavelength selection means having two or more transmission bands. However, the wavelength selection

mean of Hori (fig. 5, element 38) does have two transmission bands as disclosed in col. 12, lines 10-14, where the transmittance curve of the inclined element differs from the transmittance curve of the element when it is not inclined. The applicant also argues the Hori teaches away from using an etalon in col. 12, lines 23-26. However, disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or non-preferred embodiments. Hori's teaching in col. 12, lines 23-36 (and also col. 11, lines 56-60) indicates that the use of etalons was known.

Regarding claims 1, 3, 4, 6, 8, 9, 12, 14 and 15, the applicant argue that the bandpass filter of Tei (fig. 1, element 8) is not a wavelength selection means or etalon having two or more transmission bands. However, Tei does disclose two or more transmission bands for fig. 1, element 8 in col. 6, line 58 to col. 7, line 6. As previously explained, disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or non-preferred embodiments; therefore Tei's disclosure is not limited to a the bandpass filter embodiment. In addition, the wavelength selection means having different transmission characteristics depending on its orientation still reads on the limitation of having "two or more transmission bands" because the claim language does not define the transmission bands as limited to a certain orientation of the wavelength selection means. Further, Tei discloses that the interference optical filter and an etalon are interchangeable (col. 1, lines 40-43), and again, disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or non-preferred embodiments.

Regarding claims 2, 5, 7, 11, 13 and 17, the applicant's arguments against Tei are not persuasive for the reasons stated above for claims 1, 3, 4, 6, 8, 9, 12, 14 and 15.

Conclusion

13. Any inquiry concerning this communication from the examiner should be directed to N. Curs whose telephone number is (571) 272-3028. The examiner can normally be reached on M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached at (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (800) 786-9199.

M. R. SEDIGHIAN
PRIMARY EXAMINER